

## *Declining Snow Accumulations on Arctic Sea Ice*

- Narrator:** Decreasing ice in the Arctic is now accompanied by a thinner blanket of snow – according to recently published research conducted by the University of Washington’s Applied Physics Laboratory.
- Ignatius Rigor:** What we found was that the snow over the Arctic Ocean – especially near the Alaska Coast – has decreased by almost 50 percent compared to measurements that we had just 10 to 20 years ago.
- Narrator:** APL-UW’s Ignatius Rigor says he’s not too surprised.
- Rigor:** We kind of expected it – the declining ice extent – since most most of the snow falls during the autumn when the ice has retreated. It falls into the ocean.
- Melinda Webster:** If there’s a delay in sea ice freezeups that means there’s no platform for snow to accumulate on, which means there’s gonna be thinner accumulative snow cover and that’s what we see in areas such as Beaufort and Chukchi seas, where the ice isn’t forming until much later. That’s where we see the thinnest snow depths.
- Narrator:** In 2012, Melinda Webster and Ignatius Rigor compared their snow measurements with data collected in recent years by air – and with data gathered on the ground in the 1950s by Arctic researchers from the then-Soviet Union.
- Webster:** Those measurements are from people who took measurements every ten meters along a snow line with a ruler during the Soviet Union era and drifting ice stations.
- Narrator:** In 2012, a P3B Orion aircraft from NASA’s IceBridge project overflowed an area near the western coast of Alaska – measuring snow depth. Webster and Rigor measured the same course on the ground.
- Rigor:** Once they flew over our field camp – you know we got the position of the plane over our area – we jumped on our snowmobiles and then took out what’s called a magniprobe.
- Webster:** It’s essentially a ski pole with a moving magnetic basket. So when you stab it into the ground, the basket goes up and it can measure the distance between the tip of the ski pole and where the magnet has gone and the instrument, which is outfitted into a backpack, records that distance or that snow thickness and the location so we can take a lot of measurements very quickly.
- Narrator:** Findings on the ground pretty much matched NASA’s airborne measurements.
- Rigor:** The correlation was pretty high. The bias or the difference between what we’re measuring on the ground and the NASA P3 measurements were just a few centimeters.
- Narrator:** UW researchers found the snowpack has dropped from 14 inches to 9 inches in the western Arctic and from 13 inches to 6 inches in the Beaufort and Chukchi seas.
- Rigor:** Snow is one of the biggest unknowns as far as being able to predict what’s going to happen to the sea ice. It’s this critical interface between the ocean and the atmosphere and ... sea ice, basically since it insulates the ice and the ocean from the atmosphere – the thicker the snow is, the less interaction there is. If the ice is thin and the air is cold, ice can grow like crazy.
- Webster:** It’s definitely something that we’ll monitor to understand better. And with the synthesis of all these airborne, in situ and modeling data, we’ll understand it better. But there’s still a lot of work to be done.

**This is APL    The Applied Physics Laboratory at the University of Washington in Seattle.**